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# REPORT

ON THE

## ROYAL AIR FORCE PROMOTION EXAMINATIONS “B” AND “C,”

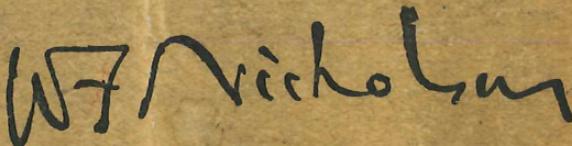
held on 28th, 29th, 30th and 31st July, 1926.

With Copies of the Examination Papers and  
Examiner's remarks thereon.

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The following report on the Royal Air Force promotion examinations “B” and “C” held on the 28th, 29th, 30th and 31st July, 1926, is issued for the information and guidance of all concerned.

*By Command of the Air Council,*



AIR MINISTRY,  
*Published December, 1926.*

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## GENERAL REMARKS.

1.—(i) This is the second report to be published on the Promotion Examinations since their institution in the Royal Air Force. These examinations were held on the 28th, 29th, 30th and 31st July, 1926, and are dealt with in two parts as follows :—

(a) Part I.—Promotion Examination “B.”  
Question papers and remarks by the examiner on each subject.

(b) Part II.—Promotion Examination “C.”  
Question papers and remarks by the examiner on each subject.

(ii) This report, which is issued for the information of those officers who sat for the Promotion Examinations held in July, 1926, and for the guidance of future candidates, should be carefully studied in conjunction with the previous report. (A.P. 1215—on sale at H.M.S.O., price 6d.)

2. When it is taken into consideration that the candidates who sat for the second Promotion Examinations had access to the previous report, the results compare unfavourably with those of the first examinations. The following is a comparison :—

*January, 1926.*

*July, 1926.*

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EXAMINATION “B.”

Passed	- - -	74%
Obtained	80% and over of total marks	18%

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EXAMINATION “B.”

Passed	- - -	69%
Obtained	80% and over of total marks	7%

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EXAMINATION “C.”

Passed	- - -	76%
Obtained	80% and over of total marks	8%

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EXAMINATION “C.”

Passed	- - -	76%
Obtained	80% and over of total marks	5%

3.—(i) It was evident that several candidates had devoted much study to the different subjects and obtained a good percentage of marks on all papers. Others had obviously studied the subjects less seriously and submitted very poor papers, a few being of an exceptionally low standard.

(ii) Three of the candidates who failed to pass in one subject in the last Examination again failed to pass in the same subject. This shows a lack of preparation; it is considered that there should be no failures when candidates

have one subject only on which to concentrate. It cannot be emphasised too strongly that candidates must prepare themselves adequately for their Promotion Examinations.

4. Whilst some candidates showed a distinct weakness in dealing with the questions on every-day duties, the general standard of practical knowledge showed an improvement, but the majority of candidates appeared to lack the essential theoretical knowledge to answer, even moderately well, questions on aircraft and engines. A thorough study of these subjects is most essential. A combination of theoretical and practical knowledge goes far to ensure safe flying and good airmanship.

5. The inability of the average candidate to make even simple sketches or diagrams was very noticeable. This requires practice in order that candidates may be able to illustrate their answers neatly and intelligibly by these means.

6. Most candidates appear to have read intelligently the books and Air Publications recommended, but there is much need for improvement in dealing with questions connected with the other services, also in geography.

7. The question paper on the subject of signals was satisfactorily answered by most candidates, but as this subject was a new and an additional one to the syllabus, the questions were consequently very elementary.

8. A general improvement was shown in dealing with the important subject of Air Force Law, even so, it was noticeable that practical questions on ordinary service matters were not well answered.

9.—(i) Candidates are advised to refer to the Report on the Promotion Examinations held in January, 1926, (A.P. 1215), especially page 3, paragraphs 4 (i) to 4 (v).

(ii) The essential points enumerated in the previous report are repeated below. If future candidates keep these in mind they should, with the necessary knowledge of the different subjects, be able to pass their examinations easily and obtain a high percentage of marks.

(a) Study the questions carefully before attempting to answer them.

(b) Arrange your ideas in logical sequence before and when answering questions.

(c) Support your statements by reasons.

(d) If assumptions are made, they must be stated.

(e) Do not introduce irrelevant matter. Pay attention to grammar, composition, writing, spelling, sketching and the drawing of diagrams. Avoid slang and catch phrases.

(f) Number your answers correctly to agree with the numbers of the questions.

*J. A. B. Vesey*

Air Vice-Marshal,  
Director of Organisation and Staff Duties.

### AIR MINISTRY.

## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

## PART I.

## Subject 1a.

## FLYING.

Time allowed, 3 hours.

**Total Marks, 500.**

Questions 1 to 10 inclusive must be answered.

Questions 11 to 20 inclusive, five only to be answered.

**35 Question 1.**—Define the following :—

**marks.**                    (a) Angle of incidence.  
                               (b) Lift.  
                               (c) Drag.  
                               (d) Centre of pressure.  
                               (e) Centre of gravity.  
                               (f) Dihedral.  
                               (g) Anhedral or negative dihedral.

**35 Question 2.**—Describe how you would execute a forced landing, with an aeroplane, in a river.**35 Question 3.**—Give the four signals used by a pilot marks. to communicate with airmen stationed at the wing tips when taxiing an aeroplane.**35 Question 4.**—What is the effect of the slipstream marks. of an airscrew, and how is this effect sometimes neutralized ? Give two methods.**35 Question 5.**—What information should you give marks. to your unit in the event of a forced landing with an aeroplane due to engine failure ?**35 Question 6.**—How do you turn a seaplane out of marks. a strong wind when taxiing ?**35 Question 7.**—Describe how you would take off a marks. flying boat in calm water.**35 Question 8.**—Give the standard drill for airscrew marks. swinging—

(a) By hand.  
                               (b) With a Hucks starter.

**35 Question 9.**—Describe how you would render your marks. aeroplane safe for the night after a forced landing in an ordinary field during windy weather. Give details of materials required and how you would use them.

**35 Question 10.**—What parts of an aeroplane should marks. you inspect before taking it into the air?

**30 Question 11.**—What is meant by the term marks. "Balanced Controls"?

**30 Question 12.**—Describe how you would roll off marks. the top of a loop.

**30 Question 13.**—Why is it inadvisable to fly a Bristol marks. Fighter (for example) from the front seat, without carrying either ballast or a passenger in the rear seat, though the aeroplane may be quite controllable in level flight?

**30 Question 14.**—What is the effect of gyroscopic marks. action on a tractor aeroplane fitted with a rotary engine which rotates clockwise as viewed by the pilot from his seat?

**30 Question 15.**—What information would you give marks. in a W/T message in the event of a forced landing with a seaplane?

**30 Question 16.**—The drag of the floats of a seaplane marks. has a marked effect in a dive. What is this, and how does the pilot guard against its effects?

**30 Question 17.**—What are the three groups of forces marks. acting upon an aeroplane in flight?

**30 Question 18.**—Describe how you would take off marks. across wind with an aeroplane.

**30 Question 19.**—Give the considerations which marks. would affect your choice of a field in which to make a forced landing.

**30 Questions 20.**—Give four of the general rules of marks. the air.

#### REMARKS ON SUBJECT 1a—FLYING.

1. *General.*—The question paper set for Subject 1a—Flying was an easy and practical paper. The answers given by candidates were, on the whole, satisfactory, but many of them showed scanty knowledge of some of the essential and

everyday duties with which all pilots should be thoroughly conversant, such as :—

- (a) Signals used between the pilot of an aircraft and the airmen stationed at the wing tips.
- (b) Standard drill for airscrew swinging.
- (c) Rules of the air.

2. (i). *Question 1* led to several attempts to quote answers verbatim from the textbook, which had been imperfectly understood. The results were in some instances very poor.

(ii) In replying to Question 2, few officers seemed to realise that a landplane alighting on water will almost certainly turn over in spite of all attempts to make a very slow alighting and they failed to state any precautions which should be taken to ensure early escape of the occupants and avoidance of injury, such as ensuring that safety belts can be unfastened instantaneously and preventing the occupants being thrown forward by placing a hand out in front on some solid part of the aircraft.

(iii) *Question 3*.—Very few candidates answered this question right in spite of the fact that such signals should be in everyday use. Elaborate signals were invented and it is evident from the answers given that the majority of airmen must work by intuition when assisting pilots to taxi aircraft.

(iv) *Question 4* was well answered generally, but some candidates confused slip stream with torque.

(v) *Question 5* was rather poorly answered, especially so since this very necessary knowledge must be used in practice from time to time by most officers. Omissions of important information were too common.

(vi) Many officers have clearly not had experience with either seaplanes or flying boats and some had not read the textbook which might have enabled them to give better answers to Questions 6 and 7.

(vii) *Question 8*.—The inability of the majority of officers to answer this even moderately correctly appears to afford evidence of the disuse of the regular drill for airscrew swinging or non-observance of the instructions which should be posted inside every aircraft hangar.

(viii) *Question 9* was fairly well answered on the whole. Many omitted to ensure that the petrol had been turned off; radiator drained in cold weather, etc., and others failed to mention the digging in of wheels and raising of tail to reduce head resistance during a storm.

(ix) *Question 10*.—Some answers to this question seem to indicate that many officers either omit to inspect their

aeroplanes at all before flight or else carry out a most superficial examination.

(x) *Question 11.*—Only a few candidates attempted this very easy question and of these some gave poor answers.

(xi) Those who did question 12 did it well, but a relatively small number attempted it.

(xii) *Question 13* was not very well answered. The answers in some cases amounted to not more than a general agreement with the statement that the practice of not carrying either a passenger or ballast was inadvisable, but omitted to say why.

(xiii) Most candidates attempted Questions 14 to 19 inclusive and gave good answers.

(xiv) In reply to Question 20, many candidates gave extracts from the local rules of their past and present aerodromes whilst others made attempts to answer from the rules as laid down in Flying Training Manual, Part I., Appendix I. The knowledge of candidates in this subject seemed to be weak.

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## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

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### SUBJECT Ib.

#### FLYING.

Time allowed, 3 hours.

**Total Marks, 500.**

Questions 1 to 8 inclusive, must be answered.

Questions 9 to 15 inclusive, five only to be answered.

NOTE.—*Calculations should be shown where necessary.*

**40      Question 1.**—Define the following :—  
marks.

- (a) Contour.
- (b) Datum Level.
- (c) Estuary.
- (d) Meridian.
- (e) Small Circle.
- (f) Spot Height.
- (g) Water Shed.
- (h) Vertical Interval.

**40 Question 2.**—The magnetic bearing of A from B marks. is  $320^{\circ}$  in 1926, and variation is given as  $15^{\circ}$  E. in 1916, increasing  $9'$  annually. What is the true bearing?

**40 Question 3.**—You are ordered to carry out a reconnaissance on an aircraft which has a normal cruising speed of 115 m.p.h. and a fuel capacity allowing 7 hours flying at that speed. On the outward journey, the wind is in your favour and you fly at a ground speed of 140 m.p.h. By calculation, you find that you will fly at a ground speed of 100 m.p.h. on the return journey. How far can you go from your aerodrome?

**40 Question 4.**—What are the chief aids to air pilotage marks. at night, and in what order of prominence do ground features show up?

**40 Question 5.**—Why is it probable that in a future marks. war, bomber and fighter aircraft will usually fly in formation by day?

**60 Question 6.**—You are in a S.S.F. aircraft over marks. enemy territory. You have become detached from your flight and are returning to your aerodrome or base. Assuming that you have an ample margin of fuel left, what action would you take if you saw—

- (a) An enemy Two-seater Fighter,
- or (b) An enemy S.S. Fighter,
- or (c) An enemy Kite Balloon?

Select one and give reasons for your action. Any reasonable assumption may be made, but should be stated.

**60 Question 7.**—What is the object of a "combined marks. attack" by aircraft; what types of aircraft would you expect to find taking part, and how should each type be utilised?

**30 Question 8.**—Compare and explain the different marks. methods adopted for getting aircraft into formation. State the circumstances in which each method will be used.

**30 Question 9.**—Give a brief explanation of the marks. difference between Maps and Charts.

**30 Question 10.**—What does representative fraction marks. mean? If the representative fraction is  $\frac{1}{1000000}$ , how many miles does this represent to one inch?

**30 Question 11.**—If a magnet and a bar of soft iron marks. are placed near each other and in the same straight line—

(a) Draw the lines of force.

(b) Why should a bar of soft iron when near a compass be likely to affect the compass needle? Would the effect be constant or variable?

**30 Question 12.**—Bubbles appear in the compass marks. which is fitted to your aircraft. Why must the bubbles be removed and how is this done ?

**30 Question 13.**—Give the qualifications you consider necessary for a night flying pilot.

**30 Question 14.**—By means of rough diagrams, show marks. the positions of navigation lights on aircraft, and their arcs of visibility.

**30 Question 15.**—Give what you consider to be the marks. chief characteristics necessary for a single-seater fighter aircraft, and state why these characteristics are necessary.

#### REMARKS ON SUBJECT Ib—FLYING.

1. The question paper on this subject was considered easy and though some answers were good the result as a whole was somewhat disappointing.

Many candidates failed to study the questions with enough care, whilst some ignored the instructions as to the number of questions to be answered.

2.—(i) *Question 1.*—The definitions were on the whole well given. The main mistakes were made in defining Watershed and Estuary.

(ii) *Question 2.*—This question was attempted by most candidates and generally well answered. In some cases the variation was subtracted instead of added and in others the working out was not shown: consequently, marks were lost.

(iii) *Question 3.*—White's Formula was usually known and the answer was in several instances obtained correctly and shortly by Algebra. One candidate deducted as much as 25 per cent. off the radius of action for safety, whilst a few candidates omitted to show calculations.

(iv) *Question 4.*—The chief aids to air pilotage at night were not well given. These can be found in Flying Training, Part II, Sec. 58 (4).

(v) *Question 5.*—The three points which should have been slightly enlarged upon in answer to this question were :—

- (i) Concentration
- (ii) Mutual support.
- (iii) Moral advantage.

There was a great deal of entirely irrelevant matter introduced into the answers. The primary objects can be found in Flying Training, Part II, Sec. 60 (4).

(vi) *Question 6.*—The Kite Balloon was the most popular choice of the three alternatives in this question. The majority of answers showed that the pilot seemed far more concerned as to his own safety than the shooting down of the target. The time factor does not seem to be generally appreciated when carrying out an attack of this nature. It should be borne in mind that when the aircraft is fired at from the ground, it gives warning to the balloon, therefore, no time should be lost in launching the attack.

(vii) *Question 7.*—Where the expression “combined attack” was understood it was generally well answered. Flying Training, Part II, Sec. 143, particularly sub-para. (2), can be read with advantage by most candidates who attempted this question.

(viii) *Questions 8, 9 and 10* were generally well answered by most candidates.

(ix) *Question 11.*—Few candidates attempted this question. Those who did drew the lines of force badly, and the answers were not well expressed.

(x) *Question 12.*—Very few candidates gave all the points in the removal of bubbles. No one forgot the use of the fountain-pen filler.

(xi) *Question 13.*—This question was generally well answered. Many candidates took advantage of this opportunity of enlarging upon the qualities of their ideal pilot.

(xii) *Question 14.*—Few candidates gave more than one diagram and this usually showed the plan view. Flying Training, Part II, page 116, should be studied in connection with this question.

(xiii) *Question 15.*—This question was generally well answered by those who attempted it.

## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

**SUBJECT II.****AIRCRAFT.**

Time allowed, 3 hours.

**Total Marks, 500.**

Questions 1 to 14 inclusive, ten only to be answered.

*NOTE.—Each candidate is to select any one type of Service aircraft, which he must write clearly at the top of his paper. Answers to all questions which refer to particular aircraft must relate to this type only.*

**50 Question 1.**—Give a brief description of the manner marks. in which the stresses set up in an aircraft are distributed about the structure. Elucidate your answer with a diagram.

**50 Question 2.**—What members of the structure of marks. an aircraft are mostly heavily loaded during—

- (a) normal flight ?
- (b) landing ?

**50 Question 3.**—Sketch and describe the arrangements marks. made for absorbing landing shocks on the aircraft which you have selected for this paper, and say how adjustment of the shock-absorbing gear may be effected.

**50 Question 4.**—How would you detect and correct a marks. twisted fuselage ?

**50 Question 5.**—Describe briefly the tests to which marks. you would subject an aircraft in order to ascertain that the rigging was true—

- (a) In the shop, before flight.
- (b) During test flight.

**50 Question 6.**—Give air endurance at cruising speed marks. of the aircraft which you have selected for this paper; assuming that the fuel consumption is at the rate of .6 lbs. per b.h.p. per hour when the engine is developing 75 per cent. of its full power.

**50 Question 7.**—What precautions must be taken marks. when adjusting the rigging of an aircraft involving the tightening of a tension member ?

**50 Question 8.**—Explain the effect of dihedral angle marks. of the main planes on the stability in flight of an aircraft;

OR,

Describe how directional stability is obtained.

**50 Question 9.**—Draw a diagram of the aileron marks. actuating gear of the aircraft which you have selected for this paper, and indicate the points where lubrication is required.

**50 Question 10.**—Describe in detail the adjustments marks. necessary to the rigging of an aircraft to correct—

- (a) nose heaviness;
- (b) right wing down.

**50 Question 11.**—At what angle should the leading marks. edge of the main planes be to the fore and aft axis of the fuselage of the aircraft which you have selected for this paper; how would you check this angle?

**50 Question 12.**—Describe the process of applying marks. a fabric patch to the wing surface of an aircraft.

**50 Question 13.**—What is meant by "stagger" and marks. what advantage is gained by its introduction into the design of an aircraft?

**50 Question 14.**—Describe with a sketch, and explain marks. the use of a pair of trammels in rigging an aircraft.

#### REMARKS ON SUBJECT II.—AIRCRAFT.

1. The general impression received from the answers given to above paper is that the majority of the candidates have a fair knowledge of the subject; but in very few cases was the knowledge displayed in a detailed and accurate manner.

2. Clumsy phraseology and irrelevancy rendered the marking of the papers unnecessarily difficult. It was frequently necessary carefully to peruse a rambling statement, which filled two or three foolscap pages, in order to ascertain whether the candidate knew the answer to the question. In such cases two or three lines would have sufficed.

3. There were very few instances of a proper sketch being produced. Decrease of stagger or increase in tail plane incidence as a remedy for "nose heaviness" was offered by several candidates.

4.—(i) *Question 1.*—Twenty-three candidates attempted this question, out of which number four gave good answers, thirteen moderate, and the rest bad. To give the correct answer to this question requires only a very limited knowledge of mechanics, and it should have been dealt with in a more satisfactory manner.

(ii) *Question 2.*—A large number of the answers to this question gave a complete list of all the various parts of the aircraft which carry—or could be supposed by the candidate to carry—load.

(iii) *Question 3.*—The meaning of the word “absorbing” was apparently not understood by the majority of candidates attempting this question, and very few mentioned the pneumatic tyres as an important part of the shock absorbing gear.

(iv) *Question 4.*—This question was generally well answered by all those who attempted it.

(v) *Question 5.*—The answers to this question were on the whole fairly satisfactory, although about 60 per cent. of those who answered it neglected to mention the testing of the controls under (a). Many of the answers were much confused and gave long descriptions of what steps the candidate would take to correct faults found, which was not asked for.

(vi) *Question 6.*—Thirty-eight per cent. of the candidates answered this question, and the replies given were in most cases reasonably accurate. The correctness of many of the answers was vitiated by incorrect specific gravity of petrol, which in some instances was given as .6 and in others 1.0.

(vii) *Question 7.*—The answers to this question were fairly satisfactory, although many of the candidates dealt with the question without considering the possible effect on the compression member, i.e., bowing.

(viii) *Question 8.*—(i) (First part).—In very few instances was a really satisfactory and clear answer given to this question. It would appear from the answers given that the general impression is that the dihedral angle of the main planes produces a tendency to right the aircraft even when flying in a curved path with the normal angle of bank, and with the attendant apparent distortion of the gravitational field.

(ii) (Second part).—Very few attempted to answer the second part of this question: however, those answers given were moderately correct except for two candidates who stated that directional stability was obtained by having an equal amount of keel surface fore and aft of the centre of gravity.

(ix) *Question 9.*—This question was really very badly answered. With the exception of one or two, candidates were unable to produce an intelligible diagram.

(x) *Question 10.*—This question was reasonably well answered. Many of the candidates do not realise that alteration to any part of the rigging on an aircraft usually involves adjustment of other parts. Loose descriptions of work to be done and such expressions as "Slack off landing and flying wires and adjust" were of frequent occurrence.

(xi) *Question 11.*—Almost every candidate answered this question. Many erroneously gave the incidence of the main planes, whilst others treated the subject quite well.

(xii) *Question 12.*—This question was quite well answered. The majority of the answers, however, were needlessly long, some of them covering two sheets of foolscap.

(xiii) *Question 13.*—The answer to this question was purely book knowledge, and the answers given were reasonably accurate.

(xiv) *Question 14.*—This question was dealt with fairly satisfactorily by those who attempted it, but the majority of answers were unnecessarily long.

## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

### SUBJECT III.

#### ENGINES.

Time allowed, 3 hours.

**Total Marks, 500.**

Questions 1 to 5 inclusive, four only to be answered.

Questions 6 to 10 inclusive, four only to be answered.

Questions 11 and 12, one only to be answered.

Questions 13 and 14, one only to be answered.

NOTE.—*Each candidate is to select one type of engine, which he is to write clearly at the top of his paper. Answers to any of Questions 6-12 inclusive must refer to that engine only.*

**25**      *Question 1.*—State what precautions are to be marks. taken in frosty weather after flight and before running up of—

- (a) Water-cooled engines.
- (b) Air-cooled engines.

**25 Question 2.**—State the symptoms and causes of—  
**marks.**      (a) Too weak a mixture.  
                   (b) Too rich a mixture.

**25 Question 3.**—What is meant by a “ Floating ” and  
**marks.** a “ Fixed ” gudgeon pin ? State the points to be  
                   observed in fitting each kind.

**25 Question 4.**—State the special points to be  
**marks.** observed in—

- (a) Grinding in an old valve.
- (b) Renewing a valve.
- (c) Renewing a piston ring.

**25 Question 5.**—What is meant by, and what are the  
**marks.** causes of, “ Pre-ignition ” ?

**75 Question 6.**—Describe in detail, and in the correct  
**marks.** sequence of operations, the process of “ Top over-  
                   haul.” State the special points to be observed at  
                   each stage.

**75 Question 7.**—Give the clearances and tolerances  
**marks.** of the following, stating the maximum and minimum  
                   limits where applicable :—

- (a) Fit of gudgeon pin in small end.
- (b) Valve tappets.
- (c) Gap in piston ring.
- (d) Diametrical clearances between big end  
                   and crankpin.
- (e) Difference in diameter between piston and  
                   cylinder bore.

**75 Question 8.**—Give the following particulars :—  
**marks.**

- (a) Ignition advance in degrees.
- (b) Maximum permissible revolutions per  
                   minute for short periods.
- (c) Type of sparking plug used.
- (d) Weight of engine (dry).
- (e) Petrol and oil consumption at normal  
                   revolutions per minute.

**75 Question 9.**—Describe the lubrication system, and  
**marks.** state maximum and minimum oil pressures.

**75 Question 10.**—Give the following particulars :—  
**marks.**

- (a) Firing sequence.
- (b) Ignition timing, and how it is carried out.
- (c) Valve timing.

**75 Question 11.**—Describe briefly the carburettor  
**marks.** and the altitude control in use on the engine you have  
                   selected for this paper.

75      **Question 12.**—Explain the following particulars of marks. the engine you have selected for this paper :—

- (a) Probable causes of the carburettor flooding.
- (b) The provision in the design of the carburettor for slow running.
- (c) The altitude control system.

25      **Question 13.**—Give four probable causes for loss marks. of power and reduced revolutions of an engine at full throttle.

25      **Question 14.**—Give four probable causes for an marks. engine vibrating at all speeds.

#### REMARKS ON SUBJECT III.—ENGINES.

1. *General.*—Considering that a sound knowledge of the engine with which a candidate should be familiar would easily have enabled him to obtain sufficient marks to pass, the number of failures was rather large, and of those who failed, some did so rather badly.

2. The majority of papers submitted, however, were good and some were excellent.

Candidates had evidently benefited by the report on the first examinations, as there was only one candidate who answered more than the necessary number of questions, and only one who did not give the engine selected by him.

3. Though sketches were not actually asked for, the absence of them in most of the papers was disappointing. Even a trained engineer invariably has recourse to a sketch for an easy and simple method of explanation, and candidates would do well to cultivate the art of sketching.

4. Candidates are recommended to study the questions carefully before attempting to reply and by so doing will avoid wasting their time in explanations which are not asked for. For instance, many candidates gave lengthy explanations, in answer to question 12, as to the reasons for having an altitude control.

5.—(i) *Question 1.*—This question was generally well answered. Some candidates, however, considered it a sufficient answer, for water-cooled engines, to empty the radiator and hang up a "No Water" board.

(ii) *Question 2.*—This question was answered by nearly all candidates, generally very well.

(iii) *Question 3.*—This was answered by less than half, but the answers were good. Some candidates stated that a "fixed" gudgeon pin may be fitted either in the piston or small end. On no engine in the service has the practice of fitting the pin in the small end ever been adopted: candidates are examined on their service experience only.

(iv) *Questions 4, 13 and 14,* were generally well answered, but many candidates confused pre-ignition with a "too far advanced" ignition in answering Question 5.

(v) *Question 6.*—This was answered by about 75 per cent. of the candidates. Some of the answers were so poor that it was obvious that the writers have never done the work themselves, neither have they taken any interest when done by someone else in their units.

(vi) *Question 7.*—This was attempted by only a few candidates and with few exceptions was badly answered.

(vii) *Question 8.*—This question was answered by nearly all candidates. The answers demonstrated how many were ignorant of the "Leading Particulars" of their engine. The figures given for fuel consumption were in some instances fantastical.

(viii) *Question 9* was the most popular and best answered question and *Question 10* was answered by nearly all candidates. Many gave the method of timing the valves in part (c), but failed to give the actual valve timing.

(ix) *Questions 11 and 12.*—Each of these questions was answered by about half the candidates. In contrast to some excellent and very good answers, a few were very bad.

## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

**SUBJECT IV.****AIR FORCE LAW.**

Time allowed, 3 hours.

**Total Marks, 300.**

Questions 1 to 14 inclusive, ten only to be answered.

*NOTE.—Candidates are allowed to make use of King's Regulations and the Manual of Air Force Law. The authority for each answer is to be quoted as follows:—*

(a) "King's Regulations" by paragraphs thus : K.R., para. 126.

(b) "Manual of Air Force Law" as follows :— Part 1 by Chapter and paragraph thus : M.A.F.L., Chap. 3, para. 8. Air Force Act by sections thus : A.F.A., S.9 (2).

Rules of Procedure by numbers thus : R.P. 27 (c).

**30 Question 1.**—(i) Can a Summary of Evidence be marks. taken upon oath, and if so, under what circumstances ?

(ii) An accused, after being duly cautioned, elects to give evidence in his defence at a Summary of Evidence. Has the officer taking the Summary of Evidence any right to cross-examine the accused upon the evidence he gives ?

**30 Question 2.**—What are the various kinds of Courts marks. Martial ? Explain the main differences between them.

**30 Question 3.**—Who may act as Judge Advocate at marks. a Court Martial ? What are his duties ?

**30 Question 4.**—(i) What is the meaning of the expressions :

(a) "Lawful command"

(b) "Superior officer" ?

(ii) Is a Service policeman the "Superior officer" of a leading aircraftman ?

**30 Question 5.**—No. 0000, A.C.1 Jones, X (Bombing) marks. Squadron, Underavon, was ordered at 10.00 hours on 4th March, 1926, by Flight Sergeant Smith of his Squadron to report at the Orderly Room at 10.30 hours that

day. A.C.1 Jones replied "I refuse to go." Flight Sergeant Smith immediately put A.C.1 Jones into close arrest, and he was taken under escort to the guard-room. Draft the appropriate charge to be preferred against A.C.1 Jones for trial by Court Martial.

**30 Question 6.**—Under what circumstances can an marks. airman convicted by Court Martial of an offence be awarded Field Punishment and to what extent? What is the nature of Field Punishment?

**30 Question 7.**—(i) Explain the following :—  
marks.

- (a) Plea of "Not Guilty."
- (b) "Air Officer."
- (c) "Malingering."
- (d) "Air Force custody."
- (e) "Mutiny."

(ii) A person subject to the Air Force Act is found to be intoxicated by reason of over indulgence in drugs. With what offence, if any, can he be charged, and under what section of the Air Force Act?

**30 Question 8.**—In your capacity as Personnel Officer marks. at a Group Headquarters, it comes to your notice that the commanding officer of a Squadron within your Group has awarded the following summary punishments:—

- (a) To Corporal Smith—One month imprisonment with hard labour.
- (b) To A.C.2 Robinson—56 days detention.

What action should you put up to your Air Commodore commanding the Group in connection with these awards?

**30 Question 9.**—(i) What is a Court of Inquiry, and marks. by whom may it be assembled?

(ii) What rights has an airman whose character or reputation, as a member of the Air Force, is affected by the evidence given before a Court of Inquiry?

**30 Question 10.**—(i) Under what circumstances, if marks. any, could the following be tried by Court Martial:—

- (a) A branch manager of the Navy, Army and Air Force Institutes?

(b) An Arab coolie employed in a menial position in a Squadron serving in Iraq?

(ii) Could either be dealt with summarily by the commanding officer?

**30 Question 11.**—What are the powers of an officer marks. commanding a detachment to award summary punishments?

**30 Question 12.**—L.A.C. Brown has been arrested on a charge of stealing 10s. in silver the property of another aircraftman occupying the next bunk. You are Orderly Officer and when visiting the guard-room, the accused tells you that he wishes to make a clean breast of his trouble and then proceeds to make a detailed confession of the whole circumstances, concluding by admitting his guilt.

(i) What is your duty ?

(ii) Under what circumstances can a confession, so made, be received in evidence before the Court Martial by which the accused is subsequently tried ?

**30 Question 13.**—Flight Sergeant X is tried by District Court Martial upon a charge (under Air Force Act Section 18 (4) ) of stealing a watch belonging to a fellow Sergeant :—

(i) The evidence shows clearly that Flight Sergeant X was not the actual thief, but that he received the watch from the actual thief, well knowing it to have been stolen. When the Court is closed for consideration of finding, a member raises the question of the propriety of recording a finding of "honourable acquittal." Discuss the situation, and give your decisions as to the proper finding, with reasons.

(ii) The evidence shows clearly that Flight Sergeant X stole the watch. He pleads guilty and is convicted. Discuss the circumstances, if any, in which the Court could properly add to the sentence a recommendation to mercy.

**30 Question 14.**—Pilot Officer Z is charged under Air Force Act Section 39A (e) with wilfully causing danger in flying to the life of an airman of the Air Force. The Court are of opinion that though Pilot Officer Z did cause danger in flying to the life of the airman referred to in the charge, the evidence shows that the danger was caused negligently and not wilfully. In these circumstances can the Court find the accused guilty of any offence, and if so, of what offence ?

#### REMARKS ON SUBJECT IV.—AIR FORCE LAW.

1. *General.*—It is again noticeable that candidates studiously avoid a particular type of question, the type which demands practical application of principles of law or rules of evidence or of procedure. In other words, Questions 5, 8, 10, 12, 13 and 14 were avoided as much as possible; it is

significant that, with the exception of Question 10, these are questions which might confront any flying officer early in his career, and that whereas the answers to the remaining questions can be found in print in the Manual, the questions thus shunned demanded a decision upon a course of action.

2. (i) *Question 1.*—This question was answered by nearly all candidates, sometimes quite indifferently. The answer is to be found in R.P.4 (f and e). It was quite wrong to bring in the right of a person whose case is being summarily disposed of under section 47 to have the evidence at the actual hearing taken upon oath (K.R. and A.C.I. 1126 (3)).

Far too many candidates would allow the accused to be cross-examined at the taking of the Summary.

(ii) *Question 2.*—This question was often well answered, but sometimes the existence of Field General Courts-Martial was ignored. A good answer would deal with the composition, the jurisdiction, and the powers of punishment relevant to each type of court martial. The special rules of procedure relating to F.G.C.s M. were unfamiliar to several candidates.

(iii) A large number of answers to question 3 showed that candidates did not know that at home a judge advocate must be deputed by the Judge Advocate General; others did not state that abroad a judge advocate may be appointed by the convening officer, if his warrant entitles him to do so. Comparatively few answers dealt with the possible disqualifications for the duties of judge advocate; see Air Force Act, s. 50 (3), and R.P. 101 (B).

(iv) *Question 4.*—“Lawful command” is dealt with in Note (b) to section 9 of the Act.

“Superior officer” was too often confused with “higher authority” or equivalent terms.

Many candidates were hazy on the point whether one L.A.C. service policeman is, in fact, a superior officer of a junior L.A.C.; and possibly the phraseology of Note (b) to section 8 induces this haze; it ought to be understood that no aircraftman, whether L.A.C., A.C.1, A.C.2, or aircraft apprentice, can, for purposes of command, be the superior officer of any other aircraftman; but that it may well be the duty of one aircraftman to conform to instructions given by another aircraftman where both have been detailed by a superior officer to work together.

(v) *Question 5.*—Many candidates failed to differentiate between insubordination and disobedience. It may some day be possible to devise a form of words which will so effectually differentiate contemplated disobedience from accomplished disobedience that all students of air force law will appreciate

the distinction. In view of the words actually used by A.C.I. Jones, it needs an over-kindly disposition to be satisfied with a charge under s. 40.

(vi) *Question 6.*—Many answers failed to state that the maximum period of Field Punishment that a court martial can award is three months; some answers treated F.P. No. 1 as still allowable; but only one went so far as to aver that “an airman on active service can be awarded F.P. to the extent of death.”

(vii) *Question 7. Part (i) (a).*—Plea of “Not Guilty”: It ought to be more generally understood that every accused person has an indefeasible right to put the prosecution to actual proof of its allegations, by pleading “Not Guilty,” and that the accused person does not by so pleading add mendacity to any other offence.

(i) (b).—“Air Officer”: the definition in s. 190 (46) did not satisfy all candidates; a fair number said that a Group Captain was an air officer. Too many confused “air officer” with “air or other officer commanding,” for which there is no excuse.

(i) (c), (d) and (e).—“Malingering,” “air force custody,” and “mutiny” were as a rule correctly interpreted.

The Note to s. 19 seems to have been familiar to, or discovered by, almost all candidates who answered this question.

(viii) *Question 8* was a practical question, asking what action should be suggested; it was therefore inadequate merely to point out that the C.O. had gone astray, as most candidates did.

Part (a).—As a C.O. can never award imprisonment, the award to the corporal was illegal. It was no doubt also irregular, in that a C.O. is strictly limited by K.R. and A.C.I. in the matter of the punishments that he may award to an N.C.O. The action to put up was to cancel this award and cause the entry to be expunged (R.P. 129A).

Part (b).—Here the award was in excess of the 28 days that a C.O. may give; the action to put up was to vary the award so that it should not be in excess of that authorised by law (R.P. 129A).

(ix) *Question 9* was usually answered fairly well, but many candidates referred either to R.P. 124 exclusively, or to K.R. and A.C.I. 1296 *et seq.* only, without noticing that K.R. and A.C.I., *e.g.*, para. 1304, in fact do more to safeguard a person against whom allegations are made before a court of inquiry than the Rule of Procedure does.

(x) *Question 10.* Part (i).—If not within s. 175 (8) and therefore triable by court martial, the N.A.A.F.I. branch manager, if with air forces on active service, would be triable under s. 176 (10).

The Arab coolie in Iraq, where it is a matter of service knowledge that the air forces are still on active service, would be triable under s. 176 (9) or s. 176 (10) as the case might be.

Part (ii).—In no event could a C.O. deal with a civilian, such as the branch manager and the coolie are; before even a court martial can punish a civilian it must be proved that he is temporarily subject to the Act.

(xi) The whole answer to this question 11 lay within the four corners of K.R. and A.C.I. 1112, and it was quite unnecessary to cover (as many candidates did) a page or two pages with a statement of the powers of a C.O. under K.R. and A.C.I. 1111.

(xii) *Question 12.*—See Manual of Air Force Law, Ch. IV., paras. 73 and 76 (6).

Part (i).—Caution the accused, before he begins his statement, if possible; if he begins to confess before he can be cautioned, interrupt him and give the caution. Take the whole statement down in writing, and let the accused sign it, if he will. On no account ask him any questions before he has been cautioned. Report the matter fully at once.

Part (ii).—It is admissible, subject to proof by the prosecution that it was made voluntarily, and, so far as circumstances allowed, after a due caution.

Common errors in answering this very practical question were (a) a belief that there is a difference in the rules of admissibility in civil courts and before a court martial; (b) a belief that criminal cases cannot be tried on a confession; (c) ignoring the facts actually given in the question.

(xiii) Only one candidate in six answered question 13; only one in all answered it quite right, and one other rather well. The other answers were poor: yet the problems suggested are such as may come before any court martial where the charge assails the moral character and uprightness of the accused, and where the Service as a whole would rejoice that his rectitude should be vindicated.

Part (i).—(See Note 1 to R.P. 44.) Here the court was convinced that “X” had been guilty of grossly dishonourable conduct, the receiver being often worse than the original thief; and that conduct was intimately connected with the charge before the court. No question of honourable acquittal should be admitted for a moment.

Part (ii).—(See Manual of Air Force Law, Ch. III, para. 99.)  
 (xiv) Too many candidates treated question 14 as one asking what the charge before the court ought to have been; and on that assumption suggested other charges, e.g., under section 40 or section 11, on which P/O "Z" might have been tried. As R.P. 33 shows, the only events in which a court may alter a charge sheet are where the name or description of the accused before the court are inaccurate; in all other circumstances the court must dispose of the actual charge before it.

The particular case merely demanded a knowledge of the effect of section 56 (5) as applied to section 39A (e); and reading the two together it should be clear that the court should, on the actual charge before it, find "Z" guilty of negligently causing danger to the life of an airman in flying.

## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

### SUBJECT V.

#### ORGANISATION AND ADMINISTRATION.

Time allowed, 3 hours.

Total Marks, 300.

Question 1 must be answered.

Questions 2 to 9 inclusive, six only to be answered.

Questions 10 to 15 inclusive, five only to be answered.

NOTE.—Candidates are allowed to make use of King's Regulations and Air Council Instructions. The authority for each answer is to be quoted thus:—K.R., para. 1430, or K.R., para. 1430, 2 and 4.

**25 Question 1.**—What do you understand by "Looking after the welfare of your men"?

**25 Question 2.**—State briefly the responsibilities of an officer in charge of a flight in regard to the kit of airmen in his flight. Enumerate the points to which he should pay particular attention.

**25 Question 3.**—(a) What are the duties of the officer in charge of airmen's messing?

(b) Who is responsible for the cash accounting work in regard to airmen's messing?

**25 Question 4.**—Give a brief definition of the marks. following :—

- (a) Personal clothing issued to an airman
- (b) Public clothing issued to an airman.

**25 Question 5.**—(a) What qualifications must an marks. A.C.1 Fitter (General) possess before advancement to L.A.C. ?

- (b) Who is entitled to authorise this advancement ?

**25 Question 6.**—(a) What is the difference between marks. Class A and Class B equipment ?

- (b) How are defective articles of Class B equipment disposed of after they have been returned to store

**25 Question 7.**—Give four conditions that must be marks. fulfilled by an airman before selection for training as a pilot

**25 Question 8.**—You have an airman in your flight marks. whose work is consistently below the average. He shows little enthusiasm and has recently been awarded 14 days detention. What entries for character and trade proficiency would you expect to see on his certificate of service (Form 280) at the end of the year ?

**25 Question 9.**—How does a Flight Commander marks. record issues of technical equipment to airmen in his flight ?

**25 Question 10.**—State briefly what you understand marks. by the terms :—

- (a) Reclassification.
- (b) Remustered.

**25 Question 11.**—What are barrack damages and marks. how is payment for repair effected ?

**25 Question 12.**—When and how is an airman, who marks. is absent without leave, declared as a deserter and struck off the strength ?

**25 Question 13.**—You are in an aircraft gliding down marks. to land on an aerodrome : another aircraft also about to land passes underneath you. Which aircraft should give way ?

**25 Question 14.**—You are flying an aircraft at an marks. altitude of about 1,000 feet and circumstances necessitate your landing on a civil aerodrome. What

special civil aerodrome rules must you be careful to observe when :—

- (a) Approaching or circling the aerodrome to ascertain the direction of the wind or condition of the aerodrome ?
- (b) Choosing the actual part of the aerodrome on which to land ?

**25 Question 15.**—(a) You are in charge of a flight marks. and certain alterations affecting the airworthiness have been made to an aircraft which is allotted to a pilot in your flight. The Flight Sergeant reports that the work is completed and ready for test.

- (1) What are your duties as Flight Commander ?
- (2) What limitations are imposed on passenger carrying during test flight ?
- (b) Who is directly responsible for an aircraft's maintenance in a serviceable condition ?

#### REMARKS ON SUBJECT V.—ORGANISATION AND ADMINISTRATION.

1. The general standard of knowledge displayed in answers on this subject was satisfactory. A few candidates answered too many questions.

2. Several candidates gave correct answers to questions which they had obviously looked up in the appropriate paragraphs of K.R. and A.C.I., but they failed to support their answers by giving the references to these paragraphs as directed in the instructions at the top of the question paper.

3. The answers to some questions were given thus :—  
“ see K.R., para. ,” this was insufficient. It was apparent that a few candidates had not taken the trouble to amend their copies of K.R. and A.C.I. to date.

4. (i) *Question 1.*—In a number of instances answers to this question were poor. Some candidates seemed to consider that “ the welfare of their men ” was the concern of a commanding officer alone.

(ii) *Question 3.*—A few candidates gave the reference K.R., para. 1721, but stated that the Adjutant is responsible for the cash accounting. They had evidently not read sub-para. 2.

(iii) *Question 5.*—A number of candidates gave the details of trade tests, which was not required; but omitted any reference to the educational standard or the Commanding Officer's recommendation. Several candidates thought that the O.C. Records was the authority for this advancement.

(iv) *Question 7.*—Some candidates had evidently not added the amendment "Group iv" to K.R. and A.C.I., para. 481. Most candidates gave details of necessary extensions of service and/or conditions for ex-apprentices when the age limit or the rank qualifications would have been more suitable qualifications to quote.

(v) *Question 10.*—A few candidates were unaware that reclassification may be a transition downwards as well as upwards between the three classes of aircraftsmen.

(vi) *Question 12.*—Most candidates attempted this question, but only about 10 per cent. made reference to K.R., para. 524. The remainder had apparently failed to add this new para. or had failed to amend their Index to K.R. and A.C.I.

5. The remaining questions were answered satisfactorily.

The handwriting of most candidates was legible, but there were one or two outstanding exceptions.

## ROYAL AIR FORCE PROMOTION EXAMINATION "B."

JULY, 1926.

### SUBJECT VI.

#### SIGNALS.

Time allowed, 3 hours.

**Total Marks, 300.**

Questions 1 and 2, must be answered.

Questions 3 or 4; one only to be answered.

Questions 5 or 6; one only to be answered.

Questions 7 to 10; two only to be answered.

**50**      *Question 1.*—Discuss the chief advantages and **marks.** disadvantages of wireless as used for signal communication in the Royal Air Force.

**50**      *Question 2.*—What tests should be carried out to **marks.** the wireless apparatus in an aircraft immediately prior to a flight in order to ensure that the apparatus is serviceable? The type of wireless apparatus fitted in the aircraft for which you lay down tests should be stated.

**50 Question 3.**—For what part of the signal communications for R.A.F. units accompanying an Army Expeditionary Force is the Royal Air Force responsible? How are the other parts of the R.A.F. units signal communications supplied?

**50 Question 4.**—How will the necessary land line communication for the R.A.F. units of an independent air force be supplied?

**50 Question 5.**—What precautions should be taken in the signal communication of a force to prevent information falling into the hand of an enemy intelligence system?

**50 Question 6.**—(a) Define the following terms :—  
marks. (i) Code.  
                 (ii) Cypher.

(b) Describe the type of message for which you would employ

- (i) Code.
- (ii) Cypher.

**50 Question 7.**—Give the various classes of priority which may be assigned to a message; state the type of message for which each class of priority may be used and what authority is entitled to use it.

**50 Question 8.**—You are about to carry out a cross-country flight in an aircraft fitted with two-way W/T apparatus. State what steps you would take prior to the flight and during the flight to ensure that you will keep in touch by W/T with the wireless station at the place of departure and at the place of arrival.

**50 Question 9.**—What is meant by the term "Recognition Signal" and for what purposes are recognition signals used by aircraft?

**50 Question 10.**—Describe briefly the signal communication used in any R.A.F. or F.A.A. formation, unit or flight during operations. The type of formation, unit or flight for which the communications are described is to be stated.

## REMARKS ON SUBJECT VI.—SIGNALS.

1. *General.*—The answers to the question paper set on this subject showed that the parts of the Signal Manual as laid down in Air Ministry Weekly Order No. 123/26 had been studied; from this point of view, and bearing in mind that this subject was taken at this examination for the first time, the standard of the answers given was satisfactory. The majority of papers, however, indicated that the candidate had not attempted to supplement, by practical experience, the knowledge gained from the Signal Manual.

2.—(i) *Question 1.*—Most of the candidates contented themselves with making a list of the various advantages and disadvantages of wireless laid down in the Signal Manual. Very few attempted to discuss these headings or consider them against other methods of signalling. One point laid down in the Manual is as follows:—"Wireless is practically independent of the nature of the intervening country." This is a great advantage in certain localities, when it is practically impossible to erect or maintain a telegraph line. Such sentences as "Intervening objects did not interfere with reception to any extent" appeared to indicate that several candidates were not at all clear on this point. Only a few stressed the important fact that wireless was the only means of communicating with an aircraft when outside visual range.

(ii) *Question 2.*—This question asked not only what tests should be carried out to the wireless apparatus of an aircraft, but also that the apparatus chosen should be stated. Although most candidates mentioned all the points laid down in para. 101 of Signal Manual, Part II, many quoted a type of apparatus for which all the tests were inapplicable. As for example: some papers which described tests to the aerial winch and weight, quoted as the type under test R/T in single-seater fighter aircraft. A single-seater fighter aircraft has a fixed aerial and no aerial winch or weight.

(iii) *Questions 3 and 4.*—Many candidates stated that the Royal Corps of Signals supplied the necessary land line communication and the Royal Air Force supplied and operated the internal exchanges. Para 106 of Signal Manual, Part II, says, "The Army responsibility extends to the operation of telephone exchanges within the units." Most candidates misunderstood the exception—*i.e.*, "Remote Controlled W/T stations"—and appeared to consider it an isolated unit or station. A definition of a remote control wireless station appears in para. 88 of Signal Manual, Part II.

(iv) *Question 5.*—Although very few candidates attempted this question, there were some good answers. This question is fully discussed in Chap. IV of Signal Manual, Part II.

(v) *Question 6.*—The answers to this question were generally good. Many candidates omitted to say that the answer to a cypher message should normally be in the same cypher.

(vi) *Question 7.*—Most candidates answered this question. The majority stated that the emergency prefix could only be authorised by a Wing Commander or Officer Commanding, whereas this does not apply when used for enemy reports. An example of the latter would be when a Fleet Air Arm aircraft reports having sighted an enemy fleet.

(vii) *Questions 8, 9 and 10.*—Many candidates attempting these questions failed to arrange their answers in a logical order, and, in answer to Question 9, many confused a recognition signal with identification marks. The few candidates attempting Question 10—with one exception—gave generally good answers.

## ROYAL AIR FORCE PROMOTION EXAMINATION "C."

JULY, 1926.

## PART II.

## SUBJECT I.

## AIRCRAFT.

Time allowed, 3 hours.

**Total Marks, 500.**

Questions 1 to 4 inclusive, must be answered.

Questions 5 or 6, one only to be answered.

Questions 7 or 8, one only to be answered.

Questions 9, 10, 11 or 12, two only to be answered.

*NOTE.—Each candidate is to select one type of Service aircraft which he is to write clearly at the top of his paper and to which he must adhere in all answers referring to a particular type of aircraft.*

**70 Question 1.**—Describe in detail the process of **marks.** fitting a new lower starboard plane to the aircraft you have chosen for this examination.

**70 Question 2.**—To what extent does the loading of **marks.** an aircraft vary when turning on a correct bank ? Explain this by means of a diagram.

**70 Question 3.**—You are flying an aeroplane at **marks.** varying speeds, but are maintaining a constant height.

(a) What are the effects of these changes of speed on the position of the centre of pressure of the main planes ? Give reasons.

(b) Describe, giving reasons, how inherent stability is maintained under the changing conditions in a properly rigged aeroplane.

(c) How are the effects of changes of speed referred to in (a) counteracted and controlled in normal types of aircraft ?

**70 Question 4.**—Trace, by means of a diagram, the **marks.** flow of petrol in the aircraft you have chosen for the purposes of this examination.

**70 Question 5.**—Your engine fails whilst you are flying a seaplane out of sight of land, and you have alighted near a passing vessel. The sea is rough and the seaplane shows signs of breaking up.

Assuming it is daylight, describe your procedure.

**70 Question 6.**—Your aircraft has landed with repairable damage in a field of corn one mile from the road and three miles from the nearest post-office.

Assuming it is daylight, describe your procedure.

**60 Question 7.**—Define—  
**marks.** (a) Stability (in aircraft).  
 (b) Torque (in airscrews).  
 (c) Lift/Drag ratio.  
 (d) Pitch (of airscrew).  
 (e) Aspect ratio.  
 (f) Camber.

**60 Question 8.**—(a) Describe, by means of a diagram and notes, the procedure for placing an aircraft in the correct "Rigging position" prior to completely checking the rigging.

(b) Assuming the aircraft to be in the correct "Rigging position," describe the procedure for checking :—

- (i) Stagger of main planes.
- (ii) Dihedral of main planes.
- (iii) Incidence of main planes.

**45 Question 9.**—(a) Describe the functions of the tail unit of the aircraft you have selected for this examination.

(b) What is the result of off-setting a fin, and when would you do this?

**45 Question 10.**—(a) What constitutes the total keel-surface of an aircraft?

(b) What is the result when the major portion of the keel-surface is below the longitudinal axis?

**45 Question 11.**—(a) What instructions are necessary to ensure safety in swinging airscrews by hand?

(b) What special precautions should be taken before starting a hot engine?

**45 Question 12.**—Describe briefly how you would install in the aircraft you have selected for this examination :—

- (a) A main petrol tank;
- (b) An oil tank.

## REMARKS ON SUBJECT I.—AIRCRAFT.

1. *General.*—The results of the examination in this subject were disappointing, chiefly owing to defective theoretical knowledge. It cannot be emphasized too often that a sound knowledge of the fundamental laws of aero-dynamics increases safety in flying to a considerable extent. The practical knowledge shown was good on the whole.

2. Several candidates failed to read the questions with sufficient care; particularly question 3.

3.—(i) *Question 1.*—This question was generally well answered by candidates, though the following points were frequently omitted:—

- (a) Support for the port planes.
- (b) Weights at the tail to counteract weight of engine.
- (c) Final inspection.

(ii) *Question 2.*—This question baffled many candidates. Several who had obviously studied the subject in the Flying Training Manual had failed to comprehend the explanation there given.

(iii) *Question 3.*—In answer to this question, theoretical knowledge in many instances was vague and hazy, particularly with regard to (a).

(iv) *Question 4.*—The diagrams submitted were generally poorly conceived and executed, with three distinguished exceptions.

(v) *Question 5.*—Was answered by three candidates only. Precautions for the safety of the crew, though the seaplane was stated to be breaking up, was a noticeable omission.

(vi) *Question 6.*—This question was answered by the majority of the candidates. Many failed to state that they should communicate with the nearest unit and put themselves under the orders of the Commanding Officer. Another recurrent error was failure to take account of the damage done to the corn, and to refrain from discussing compensation with the farmer or local land owner. The necessity to unload guns, &c., was mostly omitted.

(vii) *Questions 7 and 8.*—This easy question 7 was attempted by remarkably few candidates, only one of whom obtained full marks. Question 8 was generally well answered.

(viii) *Questions 9 and 10.*—The usual error in the reply to question 9 (b) was in ascribing to engine torque the need for off-setting a fin. The easy theoretical question 10 was

attempted by only a few candidates, some of whom failed in their reply to part (b).

(ix) *Question 11.*—The answer to part (b) of this question, which should have been that the airscrew should be swung several times as if on contact but with the switches off, was not given in the majority of answers.

(x) *Question 12.*—Was fairly well answered by the few who attempted it.

## ROYAL AIR FORCE PROMOTION EXAMINATION "C."

JULY, 1926.

### SUBJECT II.

#### ENGINES.

Time allowed, 3 hours.

**Total marks, 500.**

Questions 1, 2, 3, 8, 9, and 10, must be answered.

Questions 4 to 7 inclusive, two only to be answered.

Questions 11 to 14 inclusive, two only to be answered.

NOTE.—*Each candidate must write clearly at the top of his paper the types of air-cooled and water-cooled engines selected by him.*

**50**      *Question 1.*—A pilot is forced to land owing to marks. engine failure, and reports to you that his engine faltered and finally cut out. State the probable cause of engine failure, and the steps you would take to verify your diagnosis.

**50**      *Question 2.*—The oil pressure of your engine falls marks. steadily after flying for an hour. Give six probable reasons.

**50**      *Question 3.*—Give the most probable reason for marks. the following irregularities in engine running during flight :—

- (a) Popping in the exhaust during a glide.
- (b) Uneven running and variation of speed of engine.
- (c) Black smoke emitted from exhaust.
- (d) Vibration which disappears with a movement of the throttle.
- (e) "Flooding" in the exhaust system.
- (f) Popping in the inlet system.

**40 Question 4.**—What methods should be adopted to marks. facilitate the starting of an engine in cold weather ?

**40 Question 5.**—When landing away from the aerodrome, an aircraft turns on to its nose, and breaks the airscrew.

What examination is necessary before you give permission for the aircraft to be flown back to the aerodrome with a new airscrew fitted ?

**40 Question 6.**—What symptoms would you expect marks. to occur in the running of an engine requiring a top overhaul ?

**40 Question 7.**—A new aircraft with engine is drawn marks. from storage. What procedure should be adopted when running the engine up for the first time before putting the aircraft into general use ?

**70 Question 8.**—Explain why "altitude control" is marks. necessary. Sketch the type fitted to one of the engines you have selected for this paper, and describe how it functions. How is the altitude control interlocked with the throttle and why ?

**70 Question 9.**—State briefly the points to be marks. observed and attention required in the maintenance of a magneto.

**70 Question 10.**—Tabulate the defects of both an marks. air-cooled and water-cooled cylinder or cylinder block which would necessitate replacement during a top overhaul of an engine.

**30 Question 11.**—Tabulate the procedure in fitting marks. a new piston and rings to a cylinder, which has already been removed from an engine, and has been checked and found serviceable.

**30 Question 12.**—What is the normal oil pressure of marks. the water-cooled engine ? State how this pressure is controlled.

**30 Question 13.**—Make a firing order diagram of marks. one engine indicating the connections from H.T. distributor to sparking plug.

**30 Question 14.**—Draw a timing diagram of one marks. engine.

## REMARKS ON SUBJECT II.—ENGINES.

1. *General.*—The question paper set on this subject was divided into two portions—questions 1 to 8 inclusive being set with a view to ascertaining the knowledge required by a squadron commander as applied to aero engines in general, and questions 10 to 14 inclusive being set to test the candidate's knowledge of any particular type of engine. Question 9 dealt with magnetos only.

2. The results as a whole may be considered satisfactory. In many instances the answers indicated that the candidates studied the various handbooks, but lacked the practical knowledge that can only be obtained by familiarity with the actual engines. Spelling and writing with one or two exceptions were good and legible, but slang terms such as "dud" were occasionally used, one candidate referring to the "bung hole" of a petrol tank. A minor point, perhaps, was the general use of the word "propeller" instead of the correct name, viz., "airscrew."

3. Considerable improvement could be shown in setting out answers. Tabular form should be employed where possible in order to avoid repetition of phrases such as "I would examine," "I would then look at," &c. One candidate repeated such phrases sixteen times in one answer.

4. Vague answers were frequent and should be avoided. "Faulty," "Defect in," "Magneto trouble" and "Petrol trouble" were terms commonly used. These are meaningless unless the defect, trouble, &c., is specifically stated. In the same way, such terms as "run over," "look at," "examine" and "inspect" are valueless unless the object of such examination is stated. Sketches were very seldom used and in question 8, where a sketch was asked for, the results were disappointing. In only nine answers did the sketches convey any idea of the subject.

5. A further weakness was shown in the diagnosis of the various faults and defects asked for. Few candidates tabulated their answers in order of probability, but jumbled up probable and almost impossible reasons.

6. Question 10 was misread by five candidates. This can only be attributed to carelessness.

7. Instructions as to questions to be answered were complied with, but some candidates did not state the type of engine selected by them.

8.—(i) *Question 1* was generally well answered except that in several answers a reasoned diagnosis was not given and most improbable reasons were given, the most favoured of these being a seized engine. Only two candidates questioned the pilot as to the time flown, oil, air or petrol pressure temperature in order to assist in locating the cause of failure.

(ii) *Question 2* was answered well by the majority of the candidates, but again several of them gave most improbable reasons.

(iii) *Question 3*.—This was fairly well answered, but it appeared that several candidates tried to quote from memory extracts from A.P. 129—Flying Training Manual, Part I. Part (a) of the question proved a stumbling block to most candidates.

(iv) Considerable disparity was shown in answers to question 4. Lack of attention to necessary details was noticeable, such as method of heating oil, ensuring that hot water passed through the radiator drain cock before turning the engine, &c. One candidate would “dope” his engine with ether. As this is a medical supply it is extremely doubtful that a medical officer would supply ether for such a purpose.

(v) *Questions 5, 6 and 7*.—Nine candidates attempted question 5: the answers given by six of them were disappointing. Seventeen candidates attempted question 6, which was fairly well answered by the majority. Vagueness of answers was the chief failing. Question 7 was attempted by five candidates. Only one displayed any knowledge of “Storage of Engines” and realised that there would be oil in the cylinders.

(vi) *Question 8*.—This question was well answered by seven candidates only. Of the remainder, eleven showed knowledge of the principles of altitude control but could not differentiate between “density” and “volume” of air. Six candidates displayed absolute ignorance. With few exceptions the sketches can only be described as bad. In eight answers no attempt was made at a sketch.

(vii) *Questions 9 and 10* were generally well answered.

(viii) Considerable disparity was shown between the best and worst of eight answers to question 11. Obviously the majority of the candidates had never seen this operation performed. Grinding in with abrasive was advised by most, but it should be known that unless an old piston and cylinder is used this is not considered good practice.

(ix) *Question 12* was attempted by eighteen candidates. Here again it was obvious that several of them had no

knowledge of the construction of a pressure release valve. Question 13 was attempted by fifteen candidates. Most of the diagrams were poor and caused much unnecessary work in tracing out connections.

(x) Question 14 was attempted by nineteen candidates and with one exception was fairly well answered.

## ROYAL AIR FORCE PROMOTION EXAMINATION "C."

JULY, 1926.

### SUBJECT IIIa.

#### AIR OPERATIONS.

Time allowed, 3 hours.

**Total Marks, 500.**

Question 1 must be answered.

Questions 2 or 3, one only to be answered.

Questions 4 or 5, one only to be answered.

Diagram to accompany Question 3.

**150**      **Question 1.**—(a) Compare air bombing with long marks. range artillery fire. Discuss briefly the advantages and disadvantages of both.

(b) You are at war against a first-class Military Power; what principal objectives would you select for Bombing? Give the reasons for your selection, state what bomb you consider best suited to each objective, and indicate the counter-measures you would expect the enemy to direct against your activities.

Your answer to (b) should be dealt with under two headings—

(i) With regard to the opening stages of a Land Campaign.

(ii) With regard to the opening stages of a Naval Action between two main Fleets, unsupported by shore-based aircraft.

Any reasonable assumption may be made.

**200**      **Question 2.**—(a) State the general nature of the marks. duties that can be performed by an Air Force in the protection of a ground force with which it is co-operating.

(b) Assuming adequate personnel and equipment are available, discuss the methods by which these duties might be carried out in each of the following operations :—

(i) In co-operation with a ground force of all Arms advancing in columns towards an enemy believed to be of equal or superior strength.

(ii) In co-operation with a ground force of all Arms retiring in good order in the presence of an enemy of superior strength.

**200 Question 3.**—You are in command of a Squadron marks. of twelve torpedo carriers (Darts) working from a shore base. You are ordered to attack an enemy Fleet at a position 15 miles south of your Base. Describe how you would conduct the approach and the attack, stating your reasons for various movements and formations.

The Fleet consists of 8 Battleships with a protecting force of two flotillas of destroyers—disposed as in the attached cruising diagram.

Speed of Fleet is 15 kts.

Course of Fleet is East.

There is no opposition from enemy aircraft.

Weather conditions—

Wind S.W. Force 3. (7 to 11 kts.)

Detached clouds at 3,000 ft.

Time of day, noon.

**150 Question 4.**—(a) It is necessary to despatch a marks. Royal Air Force unit in one of H.M. Carriers for transportation to an overseas base. Assuming the enemy is not able to interfere, how are the responsibilities and duties connected with embarkation and disembarkation divided between the Navy and Air Force ?

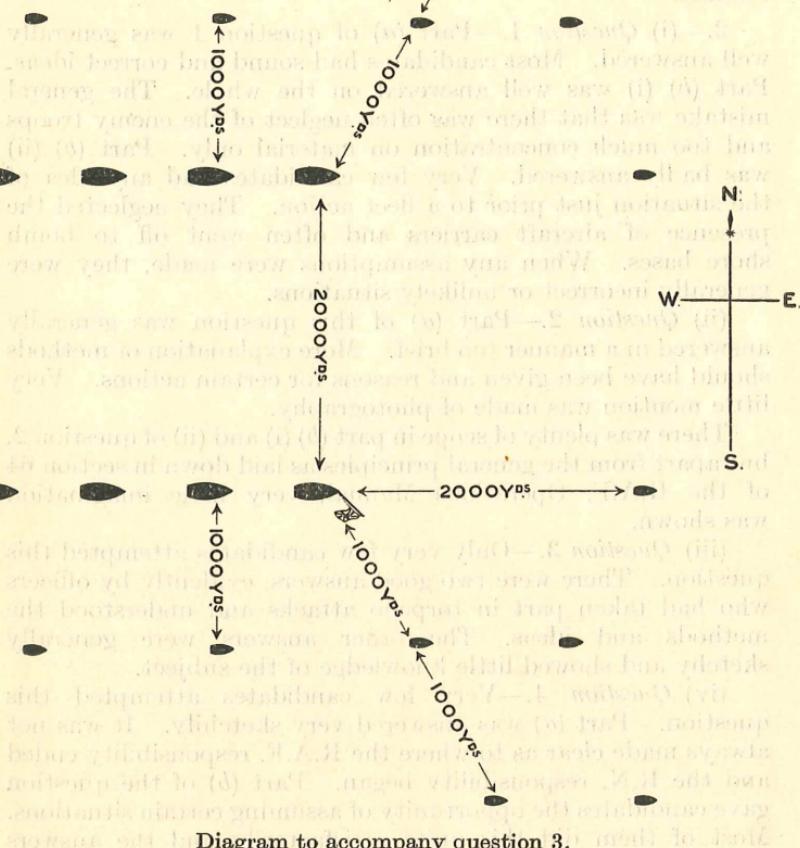
(b) Assuming that the overseas base in question is open to both air (shore-based) and sea attack, discuss the merits or otherwise of allotting aircraft to its defence.

If aircraft are considered necessary in defence, state the duties on which they should be employed and the types of aircraft you consider would be most suitable.

**150 Question 5.**—(a) Describe generally the purpose marks. of a strategical reconnaissance by an Air Force when co-operating with an Army in the opening stages of a war against a first-class Military Power.

(b) What points would you emphasize when instructing young officers in the collection and reporting of information during such a reconnaissance.

PROBLEMS FOR 3RD - 5TH FORMS TO DO PRACTISE  
 and not enough time to talk about all of it. Instead I  
 have made a few simple diagrams to show the ideas  
 involved. These include the simpler odd bootstrap bias estimates  
 mentioned here, as well as the more difficult one of estimating  
 the mean of a set of observations which have been sorted or  
 ordered.



**Diagram to accompany question 3.**

Estimate the bootstrap bias for the 3rd - 5th year (A) by  
 looking at the bootstrap mean from part (a) and the estimated  
 mean of the original data. Is the bootstrap bias positive or negative?  
 Is it large or small? Explain your answer.

## REMARKS ON SUBJECT IIIa—AIR OPERATIONS.

*1. General.*—On the whole the question paper on this subject was well answered. Several candidates showed initiative and understood the various situations well. A large number were apt to be too brief in their answers, and although it was clear that they understood the situations, they should have given their reasons for their suggested actions. There was general lack of knowledge shown by the few who attempted the naval questions. Most candidates appeared to have read and generally understood the R.A.F. Operations Manual.

*2.—(i) Question 1.*—Part (a) of question 1 was generally well answered. Most candidates had sound and correct ideas. Part (b) (i) was well answered on the whole. The general mistake was that there was often neglect of the enemy troops and too much concentration on material only. Part (b) (ii) was badly answered. Very few candidates had any idea of the situation just prior to a fleet action. They neglected the presence of aircraft carriers and often went off to bomb shore bases. When any assumptions were made, they were generally incorrect or unlikely situations.

*(ii) Question 2.*—Part (a) of this question was generally answered in a manner too brief. More explanation of methods should have been given and reasons for certain actions. Very little mention was made of photography.

There was plenty of scope in part (b) (i) and (ii) of question 2, but apart from the general principles as laid down in section 64 of the R.A.F. Operations Manual, very little imagination was shown.

*(iii) Question 3.*—Only very few candidates attempted this question. There were two good answers, evidently by officers who had taken part in torpedo attacks and understood the methods and ideas. The other answers were generally sketchy and showed little knowledge of the subject.

*(iv) Question 4.*—Very few candidates attempted this question. Part (a) was answered very sketchily. It was not always made clear as to where the R.A.F. responsibility ended and the R.N. responsibility began. Part (b) of the question gave candidates the opportunity of assuming certain situations. Most of them did this quite satisfactorily and the answers showed good reasoning.

*(v) Question 5.*—This question was answered by most candidates and Part (a) was well answered, the general omission being the lack of verification of previous situations, which showed lack of experience. Part (b) was not answered as well as was expected; very little reference being made to maps.

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**ROYAL AIR FORCE PROMOTION EXAMINATION "C."**  
**JULY, 1926.**

**SUBJECT IIIb.**

**AIR OPERATIONS.**

Time allowed, 3 hours.

**Total Marks, 500.**

Question 1, must be answered.

Questions 2 or 3, only one to be answered.

Questions 4, 5 or 6, one only to be answered.

**150 Question 1.**—"The security of a force is the first marks. responsibility of its Commander." Your squadron is on Active Service and operating against a first class military power. State briefly in order to conform to the above principle—

- (a) What considerations would guide you in the choice of an aerodrome?
- (b) What action you would take, having made your choice.

The type of squadron of which you assume yourself to be in command must be stated.

**150 Question 2.**—Enumerate—  
marks.

- (a) The various means by which aircraft can assist the Army when proceeding overseas to carry out a landing that is likely to be opposed in enemy territory.
- (b) The possible means by which aircraft can help to oppose such a landing.

**150 Question 3.**—An uncivilized and warlike tribe marks. within the boundaries of our Empire, its Protectorates or Mandated territories, has given considerable trouble and it is decided to take air action against it, unsupported by ground troops. Discuss in general terms how such an operation should be carried out.

Any reasonable assumptions may be made but must be stated.

**200 Question 4.**—"He who sends out a reconnaissance marks. usually gets the results that his instructions for it deserves."—Von Moltke. How does this apply to a Military Commander to-day?

Your answer should state the instructions and information which you would expect a Military Commander to give you as Wing Commander or Squadron Commander, in order to obtain the desired results.

**200 Question 5.**—You are detailed to give a lecture to marks. a group of R.A.F. officers on the general principles governing the employment of Reconnaissance Aircraft in a Fleet Action.

State in the form of notes the points you would bring out in your lecture.

Any reasonable assumption may be made but must be stated.

**200 Question 6.**—You are detailed to give a lecture to marks. a group of R.A.F. officers on the subject of formation flying and leadership.

State in the form of notes the points you would bring out in your lecture.

#### REMARKS ON SUBJECT IIIb—AIR OPERATIONS.

1. *General.*—This question paper, with a few exceptions, was not well answered. Some candidates did not read the questions carefully, and were inclined to wander off the point and introduce quite irrelevant matter. It was apparent that some candidates started to write answers without giving much previous thought. In some cases assumptions that should have been clearly and concisely stated at the beginning of the answer, were either omitted or placed as an afterthought in the middle of the answer.

2. The paper was simple and straightforward, questions were taken straight out of the book and should have been easy to answer if any serious reading had been given to the subject beforehand. There is room for improvement in neatness, writing, spelling and composition.

3.—(i) *Question 1.*—This was the only obligatory question in the paper, yet one candidate omitted to answer it. This question on the whole was fairly well answered, though candidates were inclined to enumerate points in the first half of the question which only appertained to the second half, whilst some candidates went into long rambling details about visits to Town Majors for billets, etc., which had nothing to do with the question as asked.

(ii) *Question 2* was attempted only by one-third of the candidates, but was well answered on the whole. Candi-

dates were inclined to omit some of the following important points :—

**First Part :—**

- (a) Gaining and maintaining air superiority.
- (b) Reconnaissance of landing beaches, including photography, with feint reconnaissances to draw away attention.
- (c) Observation of naval gun fire.
- (d) Attack with bombs and machine guns to cause delay to enemy troops being moved up to the threatened area to oppose the landing.

One candidate stated he would attack any surface craft sighted during the passage of the convoy, without differentiating between allies, neutral or enemy vessels.

**Second Part :—**

- (a) Gaining and maintaining air superiority.
- (b) Reconnaissance to disclose approach and if possible ports of embarkation.
- (c) Attack of docks, dépôts and supply ships after landing had been effected.
- (d) Attack of ports of embarkation if within range.
- (e) Reconnaissance and attack of enemy aerodromes established at advanced bases.

(iii) *Question 3.*—This was a popular question, though not well answered on the whole. Candidates were inclined to narrate historical events that they had taken part in themselves, without drawing deductions and enunciating principles. Few candidates mentioned the necessity for obtaining information concerning the topography of the country or the habits and characteristics of the tribe concerned, prior to carrying out the operations. Other important points that were omitted by various candidates were :—

- (a) Delivery of an ultimatum and warning prior to operations.
- (b) Use of demonstrations of force.
- (c) Concentration and surprise for the first attack, followed up by attacks by night and day at irregular intervals, employing different methods.
- (d) The necessity for continuous reconnaissance during operations.
- (e) A vigorous and relentless offensive to completely upset the normal tribal life.
- (f) Action to be taken in event of migration of offending tribe into territory of neighbouring tribes.

(iv) Only a few of the candidates attempted Question 4, and it was not well done. The complete answer is contained in Section 65 (12) of the R.A.F. Operations Manual. No candidate mentioned the necessity of the Military Commander giving the Air Force Commander the degree of importance attached to the acquisition of the information required, or the time by which, or the place at which, the information obtained should be furnished.

(v) Less than a quarter of the candidates answered Question 5. One candidate answered it particularly well. The complete answer is given in Section 51 (8)-(12) of the R.A.F. Operation Manual.

(vi) *Question 6.*—Over 50 per cent. of the candidates attempted this question, which was the most popular of the three alternative questions. It was fairly well answered on the whole. Candidates were inclined to omit to lay stress on the "morale" qualities and the necessity for good leadership. Several candidates failed to give the reasons for formation flying.

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## ROYAL AIR FORCE PROMOTION EXAMINATION "C."

JULY, 1926.

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### SUBJECT IV.

#### ORGANIZATION OF THE NAVY AND ARMY.

Time allowed, 3 hours.

**Total Marks, 300.**

Questions 1, 2, 3 and 4, must be answered.

Questions 5, 6 and 7, two only to be answered.

Questions 8, 9 and 10, two only to be answered.

Questions 11, 12 and 13, two only to be answered.

**30** **Question 1.**—Select THREE ONLY of the following marks. types of war vessels and give their principal characteristics and limitations. State what you know of their normal functions in battle:—

Battleship.

Battle-cruiser.

Cruiser.

Destroyer.

Submarine.

Aircraft-carrier.

**30 Question 2.**—What is the principal Naval Base in marks. each of the following areas? State the Naval Command under which each comes:—

- (a) Mediterranean.
- (b) China Sea.
- (c) Indian Ocean.
- (d) Western Atlantic.

**30 Question 3.**—Discuss briefly ONE ONLY of the following marks. subjects:—

- (a) A comparison of the characteristics of guns with those of howitzers.
- (b) A comparison of cavalry reconnaissance with air reconnaissance.
- (c) The effect of air observation on the movements of troops.

**30 Question 4.**—What are the principal characteristics of marks. Tanks? State their chief limitations, and explain their normal functions in battle.

**30 Question 5.**—Name six of the Naval dockyards in marks. Home Waters.

**30 Question 6.**—What are the principal sea-going Naval marks. commands? Outline the composition of one of them. (Names of ships or details of attendant craft are not required.)

**30 Question 7.**—Give the main gun armament of THREE marks. of the following:—

- H.M.S. "Hood."
- A "Royal Sovereign" class battleship.
- A "D" class cruiser.
- An "S" class destroyer.
- H.M.S. "Furious."
- H.M.S. "Eagle."

**30 Question 8.**—What are the ranks in (a) the Navy; marks. (b) the Army, corresponding to—

- Air Marshal,
- Air Vice Marshal,
- Group Captain,
- Wing Commander,
- Squadron Leader,
- Flight Lieutenant,
- Flying Officer,
- Sergeant?

**30 Question 9.**—Give the Military Commands and marks. independent districts into which the United Kingdom is divided.

**30 Question 10.**—What are the administrative services marks. in the British Army? State briefly and in general terms the functions of each of these Services.

**30 Question 11.**—“The rôle of the artillery is to assist marks. the other arms in breaking down opposition and to afford all possible support to the infantry. . . .”

Explain how this assistance and support may be provided and give a general outline of the employment of artillery in the rôle assigned to it.

**30 Question 12.**—(a) What is the approximate peace marks. composition of—

- (i) A battle squadron,
- (ii) A destroyer flotilla,
- (iii) A cruiser squadron ?

(b) What is the naval significance of—

- (i) A division,
- (ii) A sub-division,
- (iii) A flagship ?

**30 Question 13.**—Of what units are the following formations normally composed :—

- (a) an artillery brigade,
- (b) a cavalry brigade,
- (c) an infantry battalion ?

#### REMARKS ON SUBJECT IV.—ORGANISATION OF THE NAVY AND ARMY.

1. *General.*—With the possible exceptions of questions 1, 3, 4 and 11, this question paper called for brief and concise answers. A number of candidates were inclined to be unnecessarily verbose and to enter into details not asked for. The majority of answers indicated that the questions should have been read more carefully.

2.—(i) *Question 1.*—Was generally well answered, but several candidates credited a destroyer with defensive functions in battle which would normally apply only to a fleet in cruising formation.

(ii) *Question 2.*—The Admiralty was in many instances forestalled in the use of Singapore as a base for the China Squadron. Otherwise candidates displayed a fairly sound knowledge of Imperial geography in relation to this question.

(iii) The answers to question 3 were on the whole disappointing. Logical sequence of thought was only expressed in a few answers, and insufficient care was given to general arrangement, paragraphing and the exclusion of

irrelevant matter. Some knowledge of the subject selected was, however, evident in most of the answers given.

(iv) *Question 4.*—Was satisfactorily answered on the whole.

(v) *Questions 5, 6 and 7.*—Candidates still show a lack of general knowledge of the Royal Navy; a closer study of this subject is recommended. The majority of those who selected question 7 did not improve their marks by giving the secondary armament—usually inaccurately—when only the main armament was asked for.

(vi) *Question 8.*—Was well answered, but more than half the candidates failed to give the correct equivalents in the naval flag ranks.

(vii) *Question 9.*—Was well answered by nearly all the candidates attempting it.

(viii) Only one candidate attempted to answer question 10, which was done with only moderate success. This is a most important side of army organisation, which should be studied more closely by all those who intend taking promotion Examinations.

(ix) *Question 11.*—The remarks under (iii) above apply also to this question.

(x) *Questions 12 and 13.*—The answers to these questions showed that army organisation is better known and more studied than naval organisation. There was a tendency to omit the H.Q. Units in answering question 13.

## ROYAL AIR FORCE PROMOTION EXAMINATION "C."

JULY, 1926.

### SUBJECT V.

#### IMPERIAL GEOGRAPHY.

Time allowed, 3 hours.

**Total Marks, 300.**

Reference Map:—The World on Mercator's Projection.

Questions 1 to 7 inclusive, four only to be answered.

Questions 8 to 12 inclusive, three only to be answered.

**60      Question 1.**—What constitutes the Union of South marks. Africa? The present government in power is the South African Party; what are the three main principles of the party?

**60 Question 2.**—Owing to grave disorders in Egypt marks. in 1919 Great Britain attempted a wholly new orientation of her Egyptian policy through the Milner mission of 1920. While promising self-government in the near future, Great Britain reserved certain rights. What were these reservations?

Supposing that Great Britain were to grant complete independence to Egypt and remove all the troops from the country; what do you consider would be the logical sequence of events?

**60 Question 3.**—How did Great Britain come to be marks. selected as the mandatory power for Palestine? To what extent has this mandate facilitated communication between Baghdad and London?

**60 Question 4.**—The question of spending several marks. million pounds on a naval base at Singapore has been before the public lately.

Discuss this question and give your views on the subject.  
Mark Singapore on the map.

**60 Question 5.**—By the Treaty of Sevres (1920) marks. Constantinople remains in Turkish hands, the remainder of Turkey's European possessions are definitely lost. Why was this concession granted to Turkey?

Give briefly the principal provisions for the regulation of the neutral zone of the Straits (Sea of Marmora) as established by the Treaty.

**60 Question 6.**—Persia being midway between Iraq marks. and India would appear to be a hindrance in an all-British route to India. What steps have been taken by Great Britain to overcome this difficulty and what is the present position between Great Britain and Persia?

**60 Question 7.**—The following places have been marks. selected for R.A.F. Squadrons in India:—Ambala, Kohat, Peshawar, Quetta and Risalpur.

Draw a rough sketch of that part of India which will show the above stations, and state why they were selected.

**20 Question 8.**—Mark on the map the following places marks. and state to what power they belong:—

- (a) Philippines.
- (b) Fiji Isles.
- (c) Mauritius.
- (d) Zanzibar.
- (e) Sheik Said.
- (f) Falkland Isles.

Give a short description of the strategic importance of any one of these places.

**20 Question 9.**—What territories has Japan gained as marks. a result of the world war?

Which of these is of the greatest value to Japan, and why?

**20 Question 10.**—What exactly is meant by the marks. "Yellow Peril"?

**20 Question 11.**—The recent flights from Cairo to the Cape indicate the future line of a Cape to Cairo railway. Mark this route on the map and show Lake Victoria, Lake Tanganyika and Khartum. State through what territories this route passes and give the names of not more than two important landing stations in each territory. These are not to be entered upon the map.

**20 Question 12.**—It is stated that one of the effects of the occupation of Africa and India by European nations has been a more rapid increase of the native populations in these countries. Explain this statement.

#### REMARKS ON SUBJECT V.—IMPERIAL GEOGRAPHY.

1. *General.*—(i) The most popular questions were 2, 3, 4 and 10. Question 2 apparently appealed to the candidate who had served at some period in Egypt, and even if he was not sure of the first part of the question he certainly had his views on the second part.

(ii) The majority of the questions required only brief answers, but several candidates wrote at great length, wandering from the point with a view to showing what extra knowledge they possessed, but not necessarily gaining more marks thereby.

(iii) In questions 7, 8 and 11, the candidate was asked to make use of the map or draw a rough sketch. It was very noticeable that officers generally had very little idea of sketching or of tidiness as regards map making.

2.—(i) *Question 1.*—This question was not well worded in so far as the present government is not the South African Party. No one brought this fact to light, presuming that in theory it was to be assumed that the South African Party was still in power: however, no candidate was penalised: the examiner was lenient in allotting marks for this question, which on the whole was well answered.

(ii) *Question 2.*—The second part of this question lent itself to the candidate expressing his own ideas at length. It was generally considered that Egypt was incapable of governing itself; that, if left to do so, internal troubles would be followed by action being taken by some strong European

Power necessitating the eventual resumption of control by Great Britain.

(iii) *Question 3.*—There are three or four obvious reasons which should have been given, but very few answers to this question contained all, namely—right of conquest,—Balfour declaration,—our interest in the Suez Canal,—and our objection to any other power obtaining this mandate.

(iv) *Question 4.*—On the whole this question was well answered, but the question generally was not discussed. Both points of view should have been given. While giving all the advantages, very few candidates gave the reasons against the building of the base at Singapore, *i.e.*, immediate need for economy and the general feeling of the people against armaments at present, also the necessity for the ship of the super-dreadnought type.

(v) *Question 5.*—Only six candidates answered this question. The answer could easily have been given by anyone who had read pages 415 and sequence in Bowman's "New World."

(vi) *Question 6.*—This was not a very easy question to answer. Mention should have been made of the loan to Persia of advisers, officers, munitions and money, the building of railways by Great Britain, and the friendly advances to the present Ruler.

(vii) *Question 7.*—The answers given to this question were poor as a whole and the rough sketches were extraordinarily inaccurate and untidy. That these places were generally selected to defend India on the N.W. Frontier was well understood, but other reasons should have been given for the selection of each station.

(viii) *Question 8.*—Fifty per cent. of the candidates answered this question, and from the results it is obvious that the average officer has need to study geography far more closely. On the whole, the answers to this question were very unsatisfactory.

(ix) *Question 9.*—Many candidates made an error in stating that Korea and Guam were gained by Japan as a result of the world war.

(x) *Questions 10 and 12.*—Both easy questions and generally well answered by all candidates attempting them.

(xi) *Question 11.*—The answers to this question were disappointing and again indicated the poor geographical knowledge of the candidates.

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## ROYAL AIR FORCE PROMOTION EXAMINATION "C."

JULY, 1926.

**SUBJECT VI.****SANITATION AND HYGIENE.**

Time allowed, 3 hours.

**Total Marks, 300.**

Questions 1 and 2, one only to be answered.

Questions 3 and 4, one only to be answered.

Questions 5 to 9 inclusive, four only to be answered.

**50**      **Question 1.**—Describe by means of a diagram a marks. "deep trench" latrine for the use of British personnel.

Your camp accommodates 250 airmen. Approximate measurements should be given and the site you would choose in your camp should be stated.

**50**      **Question 2.**—You are carrying out a sanitary marks. inspection of the barrack rooms of your squadron in a tropical country. Enumerate the points to which you would give particular attention.

**50**      **Question 3.**—Your squadron (150 airmen) is marks. ordered to occupy a semi-permanent camp for a period of 6 months from April to September. Describe by means of a diagram, the ablution arrangements, both baths and benches, which you would require for your airmen. Due regard should be paid to economy in both construction and use; to location with regard to the rest of the camp, and to the conformation of the ground. You may assume that water is available in large tanks with draw off taps, placed in any position you may select.

**50**      **Question 4.**—You are in command of 200 men marks. encamped for three weeks on land adjoining a farm in England. Describe with a diagram how you would dispose of the greasy water from the kitchen, which is situated near one corner of a pasture field.

**50**      **Question 5.**—Enumerate the factors necessary to marks. produce a fresh case of malaria. What would you do to keep yourself free from malaria if you had to fly from Cairo to the Cape?

**50 Question 6.**—What do you understand by the marks. term "ventilation" and how is it normally carried out in a room? Mention any disease which has been especially associated with overcrowding and bad ventilation of barrack rooms.

**50 Question 7.**—What is the cause of scabies or marks. "itch"? What does the disease look like and how would you deal with it in the event of an airman under your command contracting it, if the services of a medical officer were not available?

**50 Question 8.**—Enumerate the hygienic requirements of a barrack kitchen with regard to—

- (a) the interior of the kitchen and larder;
- (b) personnel;
- (c) food.

**50 Question 9.**—You are in command of a squadron marks. under canvas in a tropical country where cholera, dysentery, and typhoid are prevalent. What precautions would you take to minimize the risk of outbreaks of these diseases occurring in your command?

#### REMARKS ON SUBJECT VI.—SANITATION AND HYGIENE.

1. *General.*—On the whole, this paper was much better answered than the last one, in January, 1926. There is less tendency to remarks of an impracticable, bookish nature, and the average answer shows a high degree of intelligence which constitutes the greater part of Sanitation. Although the standard demanded on this occasion was rather higher than at the last examination, the average marks awarded is actually higher than in January.

2. There is still a tendency to confuse common but quite dissimilar creatures, such as house-flies, mosquitoes and sandflies, or lice, bugs, fleas and mites. The combatant officer ought to know enough about each of the commoner infectious diseases to enable him to place it in its proper category in respect of method of spread, from which he can infer the means of prevention.

3.—(i) *Question 1.*—Was well answered, and was a popular question. The "deep-trench" latrine is a sound and practical solution of one of the problems of field conservancy, and should be familiar to all serving officers.

(ii) *Question 2.*—Also was well answered, but was unpopular probably because it called for a tabulation of points, which many candidates feared because they might inadvertently omit an important item.

(iii) *Question 3* was unpopular; perhaps candidates feared a trap in the rather lengthy question, though there was none. This question was not very well answered, many showing lack of imagination as to the true meaning of economy.

(iv) *Question 4* was a simple question, but some of the answers referred to an elaborate scheme quite unsuited to the very temporary needs of the situation.

(v) *Question 5*.—The necessary factors which should have been stated are :—

- (a) An existing case of malaria.
- (b) A susceptible person.

Both being accessible to :—

- (c) The right sort and sex of mosquito in—
- (d) The right climate.

Some candidates stated that malaria is caused by the bite (" or sting ") of a mosquito. This error is of more than mere academic importance as any sanitary measure based on it will omit isolation of the malarioous patients by means of nets, &c. This is an essential precaution, as it is the malaria in the immediate vicinity which is really dangerous, the range of flight of a mosquito being quite small.

(vi) *Question 6* was well answered. Nearly every candidate seems to have grasped the fact that ventilation, by diluting an infectious person's exhalations, may make his proximity less dangerous to his fellows.

(vii) *Question 7* was fairly well answered, but some omitted the important measure of isolation.

(viii) *Question 8*.—Allowance has been made for the fact that in a question of this sort the candidate is likely to leave out important points which in practice he would remember. The answers have therefore been judged more in general than in detail, and nearly every candidate who attempted the question was awarded pass marks in it.

(xi) *Question 9* was really well answered. Nearly every candidate tackled it, and showed that he appreciated the manner in which these intestinal diseases spread.

4. On the whole, the answers submitted were of a good standard. Most of the candidates have a fair knowledge of the elements of Hygiene. Handwriting, spelling and grammar are not in every case what they ought to be. Defects of this nature have not been taken into account in assessing the value of answers.

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